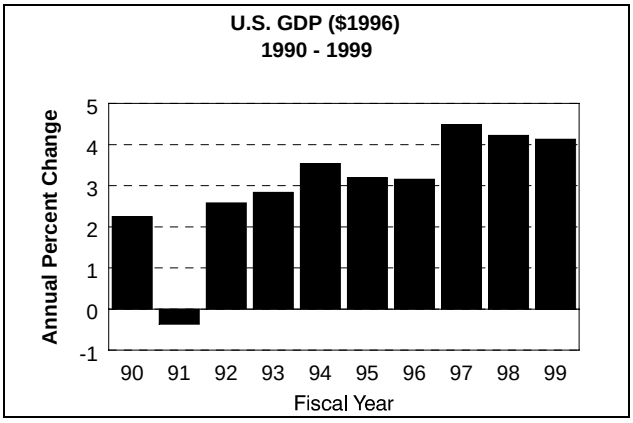
CHAPTER I

EXECUTIVE SUMMARY

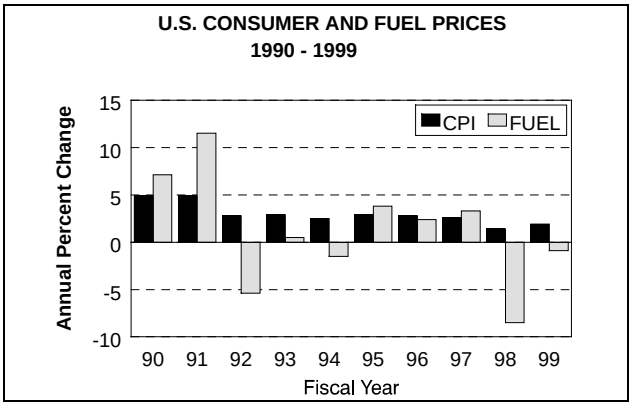
THE 1990s: A VERY GOOD DECADE FOR AVIATION!

Amid the soon to be longest post-war U.S. economic expansion, aviation enjoyed one of its best, if not the best, decade ever. The U.S. commercial aviation industry ended the 1990s by recording its sixth consecutive year of traffic growth, while the general aviation industry continued its turnaround by recording yet another record year in terms of aircraft billings.

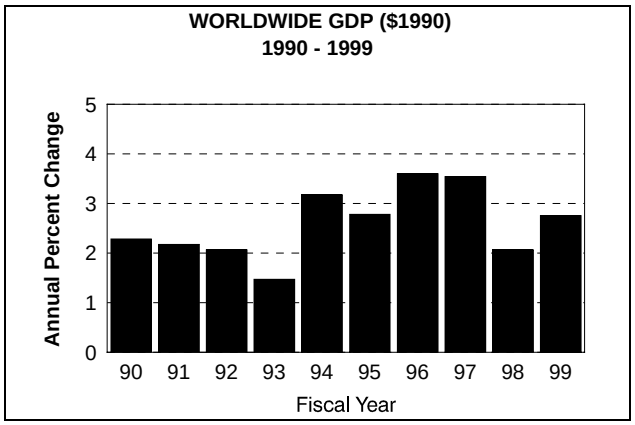
To a large extent, growth in both domestic and international aviation was driven by the continued economic expansion in the U.S and most world economies, as well as by declining fares. The current U.S. economic expansion is well into its ninth year (34 quarters, dating from 1991:3), and, baring any unforeseen event, will become the longest expansion in post-war history early next year. The longest post-war expansion dates from 1961:1 to 1969:3 (35 quarters). Real GDP growth has averaged 3.5 percent over the current expansion and 3.0 percent during the decade of the 1990s.



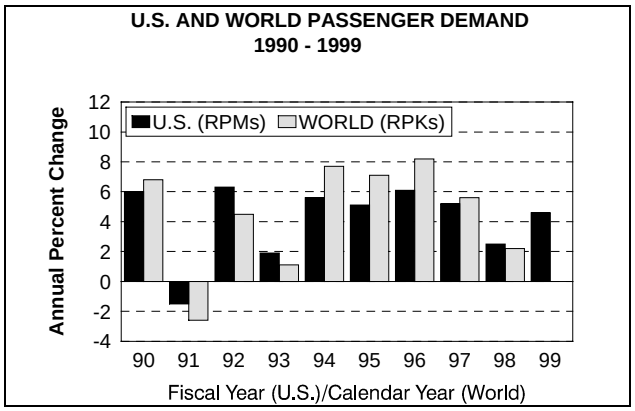
In addition, U.S. inflation (as measured by the consumer price index) averaged less than 3.0 percent during the decade. The low rate is due, in large part, to only a 1.1 percent annual increase in fuel prices during the period. However, a 8.5 percent decline in fuel prices in 1998 was largely responsible for the relatively slow growth in fuel prices over the decade.



Globally, economic gains have averaged about a half percent less (GDP up 2.6percent) than those of the United States during the decade of the 1990s. However, the slower rate of world economic growth reflects, to some extent, the impact of the Southeast Asian financial crisis in 1998, when GDP expanded by just over 2.0 percent.



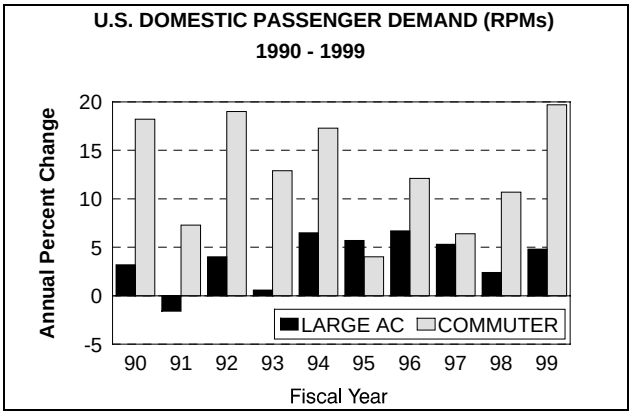
The relatively strong growth in both U.S. and world GDP is largely responsible for the strong demand for aviation services over the past decade. However, three events--the 1991 Iraqi War, worldwide passenger air carrier financial restructuring in 1993, and the 1998 Southeast Asia financial crisis--negatively impacted both worldwide and U.S. air carrier passenger demand during these years, thus reducing overall growth for the 10-year period.



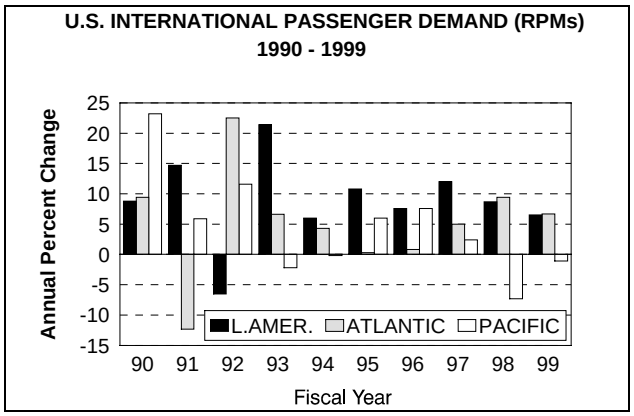
Worldwide passenger demand, as measured by revenue passenger kilometers, expanded by an average of 4.5 percent over the 1990-1998 time period. Discounting the negative or slow traffic growth in 1991, 1993, and 1998, worldwide traffic growth averaged 6.7 percent a year during the period. Although traffic figures are not available for worldwide traffic in 1999, it appears that growth should be in the 5.0 to 6.0 percent range.

U.S. air carrier (large air carriers and regionals/ commuters) traffic, as measured by revenue passenger miles (RPMs), averaged 4.3 percent during the 1990s, 5.7 percent if the three negative/slow growth years are removed from the results. While traffic during the decades of the 1970s and the 1980s grew at faster annual rates, 7.5 and 5.3 percent, respectively, than it did during the 1990s, the highest absolute gains in traffic were achieved during the decade of the 1990s. The actual increase in RPMs during the 1990s totaled 223 billion, compared to an increase of 174 billion during the 1980s, and 132 billion during the 1970s.

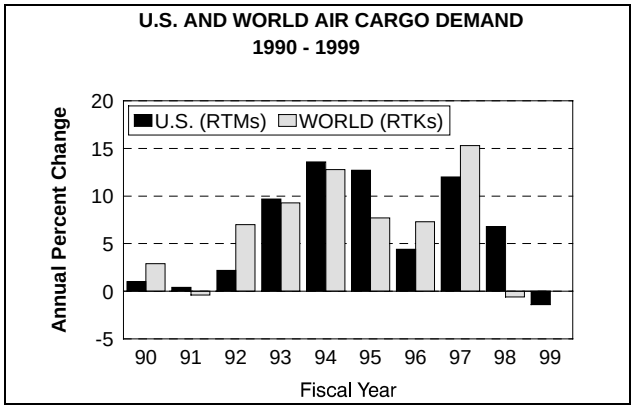
U.S. air carrier domestic traffic expanded at an annual rate of 3.9 percent during the 1990s. A large part of this growth is attributed to the smaller regional/commuter carriers, who grew at an average annual rate of 12.5 compared to 3.7 percent for the larger air carriers.



Internationally, traffic growth averaged 5.3 percent annually, the higher growth fueled, in large part, by the 8.8 percent annual increase in Latin American markets. Traffic in the Atlantic (impacted by the Iraqi War in 1991) and Pacific (impacted by the Asia financial crisis in 1998 and 1999) markets grew at annual rates of 4.9 and 4.3 percent, respectively, over the same period.

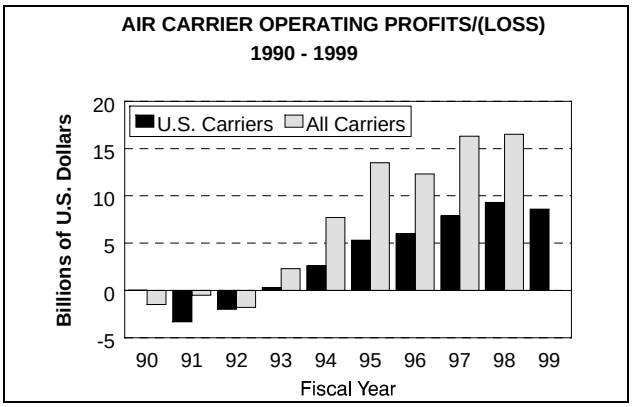


Air cargo demand grew at a somewhat faster pace than passenger demand during the 1990s, with worldwide freight ton-kilometers increasing at an annual rate of 6.7 percent over the 1990-1998 period. U.S. air carrier freight revenue ton-miles (RTMs) grew by 5.7 percent annually over the 10-year period, 4.6 percent in domestic markets and 6.9 percent in international markets.



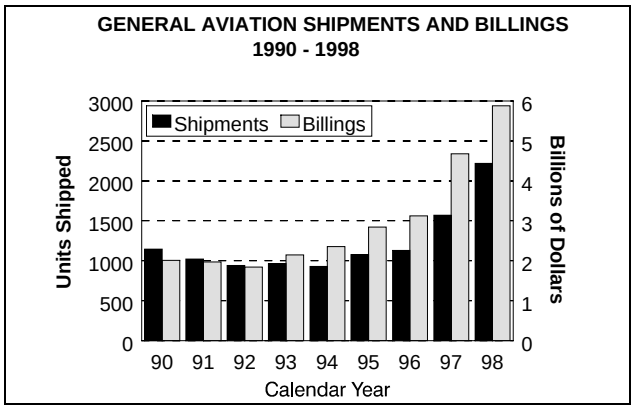
The Iraqi War and the Southeast Asian financial crisis also negatively impacted air cargo demand in 1991, 1998, and 1999. Discounting these slow or negative growth periods, worldwide air cargo demand grew at an average annual rate of 8.9 percent while U.S. air cargo demand increased at an annual rate of 7.7 percent. U.S air carrier RTMs growth averaged 6.3 percent annually in domestic markets and 9.3 percent in international markets over the 7-year period.

Expanding U.S. and world economic growth, combined with the strong demand for both passenger and air cargo services, led to record profits for both world and U.S. air carriers. Based on data compiled by the International Civil Aviation Organization (ICAO), world air carriers (including U.S. airlines) reported cumulative operating profits totaling $64.8 billion and cumulative net profits totaling $6.9 billion during the 9-year period ending in 1998. U.S. air carriers' cumulative operating and net profits totaled $34.6 and $8.6 billion, respectively, during the 10-year period ending in 1999. For U.S. carriers, this is nearly double the combined reported profits of both the decade of the 1970s ($5.8 billion operating and $3.4 billion net profits) and the decade of 1980s ($11.6 billion operating and $2.6 billion net profits).

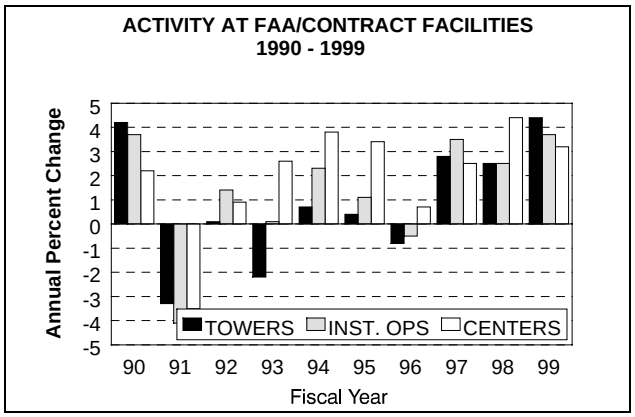


The turnaround in the general aviation industry can be attributed to a combination of two events--the current U.S. economic expansion that began in 1993 and the passage of the General Aviation Revitalization Act in 1994. General aviation aircraft shipments are expected to record a fifth consecutive year of increase in 1999 while industry billings are almost certain to surpass the all-time high record billings of $5.8 billion in 1998. General aviation shipments and billing have both more than doubled since 1994.

The FAA's General Aviation and Air Taxi Activity Survey also reports increases in both the general aviation active fleet and hours flown for a fourth consecutive year. In addition, general aviation activity at FAA air traffic facilities, both itinerant and local operations, continues to grow at above expected levels.



Despite the strong growth by both the commercial and general aviation industries during the 1990s, the increase in activity at FAA air traffic facilities has been relatively small. During the decade of the 1990s, activity growth at combined FAA and contract tower airports averaged 0.9 percent (IFR up 1.3 percent) annually, while activity at en route centers grew at an annual rate of 2.0 percent. However, most of this growth has occurred in just the last 3 years. Since 1997, activity at towered airports has increased at an annual rate of 3.2 percent (IFR up 3.1 percent), while activity at en route centers grew by 3.4 percent annually. It is the growth over the past 3 years that may portend serious problems for the future.



Certainly, the 1990s have indeed been a very good decade for both the commercial and general aviation industries. The extremely positive results of the latter half of the decade have assuredly positioned the aviation industry to enter the new millennium with high expectations for continued growth and prosperity.

REVIEW OF 1999

UNITED STATES AND WORLD ECONOMIC ACTIVITY

The U.S. economy expanded by 4.1 percent in 1999, the third consecutive increase of 4.0 percent or better. Inflation remained at relatively low historical levels (up 1.9 percent), the second consecutive year below 2.0 percent. The last time that this occurred was in 1964-65. The relatively low inflation over the past 2 years is due, in large part, to a 9.4 percent decline in fuel prices during this period—down 8.5 percent in 1998 and 0.9 percent in 1999.

Worldwide economic growth averaged only 2.7 percent in 1999, the lower growth due largely to negative growth in Latin American economies (down 0.4 percent) and relatively slow growth in European/Middle Eastern countries (up 2.0 percent). The economies of Asian/Far East countries are expected to expand by 3.2 percent in 1999, showing that the recovery from the 1997-98 financial crisis is well underway. The Canadian economy grew by 3.5 percent in 1999.

COMMERCIAL AVIATION

In 1999, the large U.S. air carriers' system capacity (ASMs or available seat miles) increased by 4.6 percent, the largest annual increase since 1990. Passenger demand (RPMs and enplanements) grew by 4.6 and 3.5 percent, respectively. As a result of slightly faster capacity growth relative to growth in traffic, the system-wide load factor (including domestic and international services) declined marginally to 70.8 percent, the first recorded decline in load factors since 1993. However, it should be noted that the 1999 load factor is still the second

highest ever recorded, second only to the 70.9 percent load factor achieved in 1998.

Domestic capacity (50 states, Puerto Rico, and the U.S. Virgin Islands) increased by 5.2 percent in 1999, also the largest capacity increase since 1990. RPMs and passenger enplanements grew by 4.8 and 3.8 percent, respectively, the result being a 0.3 point decline in load factor to 69.8 percent. This is also the first decline in domestic load factors since 1993, a period during which domestic load factors increased by 8.5 percentage points.

Regional/commuter airline traffic continued to grow at rates significantly higher than traffic of the larger air carriers, with RPMs and passengers up 19.7 and 12.0 percent, respectively. Regionals/commuters capacity increased by 17.5 percent in 1999, the result being a 1.1 point increase in load factor to 57.6 percent—a new all-time high.

In 1999, it is estimated that U.S. and foreign flag carriers combined transported a total of 132 million passengers between the United States and the rest of the world, an increase of 4.2 percent over 1998. This traffic volume is distributed among the four world travel markets as follows: 48.9 million (up 5.0 percent) in Atlantic markets; 39.2 million (up 4.2 percent) in Latin American markets; 24.1 million (up 3.0 percent) in Pacific/Far East markets; and 19.8 million (up 3.7 percent) between the United States and Canada.

On the other hand, international enplanements on U.S. flag carriers alone grew by only 0.3 percent in 1999, significantly less than the estimated growth in total international traffic to and from the United States. U.S. carrier passenger enplanements were up 6.0 percent in Atlantic markets and 4.2 percent in Latin American markets. However, the number of passenger enplanements in Pacific/Far East markets declined 12.8 percent in 1999, the second consecutive double-digit decline in these markets. The declines during 1998 and 1999 (22.1 percent) reflect the impact of the financial crisis in Southeast Asia, the Northwest Airlines pilot strike (August 28 to September 15, 1998), as well as individual carrier marketing, scheduling, and fleet strategies on the affected routes. U.S. carrier capacity on the Pacific/Far East routes was reduced by 8.6 percent over the past 2 years, with much of the capacity shifted to other international and domestic markets.

U.S. air carriers' air cargo traffic declined 1.4 percent in 1999; the first recorded decline since 1985. Domestic RTMs were up 0.3 percent while international RTMs declined 3.0 percent, the latter change largely due to declining freight movements between the U.S. and Latin American and Asian markets. Domestic freight/express RTMs (11.5 billion) declined by 0.6 percent while domestic mail RTMs (2.4 billion) were up 4.8 percent over 1998 levels. International freight/express (13.6 billion) and mail (508.9 million) RTMs were down 3.0 and 3.9 percent respectively, in 1999.

Although U.S. air carriers achieved higher growth in overall traffic levels in 1999 (4.6 versus 2.5 percent in 1998), a 2.0 percent decline in system passenger yields resulted in a $702 million decline in industry profits. Industry profits in 1999 totaled $8.5 billion, second only to the $9.3 billion earned in 1998—an all-time record high. Net profits totaled $5.3 billion in 1999, down slightly from the 1998 reported figure. It should be noted that the industry was the beneficiary of a 15.7 percent decline in the cost of jet fuel in 1998, the net result being a $1.9 billion reduction in operating expenses. Although the *average cost of jet fuel* was again lower in 1999 (49.7 versus 54.7 cents per gallon), fuel prices were up 30.0 percent over the last 6 months of fiscal 1999, rising from 44.58 cents per gallon in March to 57.8 cents a gallon in September. These higher fuel prices are one of the contributing factors to higher operating expenses and lower operating profits in 1999.

Despite the relatively large gains reported in both industry traffic and profits over the last several

years, considerable disparity continues to exist among the individual U.S. carriers. In 1999, all but one of the 13 majors reported positive earnings, with operating and net profits for the group totaling $7.6 and $4.9 billion, respectively. Operating results for the majors ranged from a high of $1.6 billion (Delta) to a low of a $143.8 million loss (Trans World). Three carriers (American, Delta, and United) accounted for over half (52.4 percent) of the group's total earnings.

The financial results of many of the smaller nationals (carriers with operating revenues between $100 million and $1 billion) and regionals (carriers with operating revenue less than $100 million) improved considerably in 1999, with only 11 of the 54 reporting carriers reporting operating losses. The combined operating profits of the reporting nationals and regionals totaled just under $1.2 billion in 1999, with earnings ranging from an operating profit of $219 million (Alaska Airlines) to an operating loss of nearly $14 million (Challenge Air Cargo). The record for the low cost, low-fare, new entrant carriers was mixed in 1999, with several of the carriers continuing to post large operating losses.

The regional/commuter airline industry posted an operating profit of $696 million in 1999, 15.5 percent higher than the $603 million recorded in 1998. The eight Form 41 carriers (operating at least one aircraft with more than 60 seats) reported operating profits of $369 million while 85 Form 298-C carriers (operating only aircraft with 60 seats or less) posted profits of $327 million.

Orders for commercial jet aircraft totaled 981 during the first 3 quarters of 1999, a 21.1 decline from the same period in 1998. The decline in 1999 is due, in large part, to the large number of orders in the two prior years, 1,369 in 1998 and 1,346 in 1997—the two all-time record highs for the industry. The smaller regional jets (30 to 75 seats) accounted for almost half of the orders (481 aircraft) during 1999, a 44.4 percent increase over orders in 1998. While the number of regional jets in the U.S. regional/commuter fleet totaled only 203 in 1999, the 920 orders over the past 7 quarters show that this will continue to be the fastest growing segment of the industry over the next several years.

A total of 815 commercial jet aircraft were delivered during the first 3 quarters of 1999, a 30.8 percent increase over the same 1998 period. The relatively large increase in new aircraft deliveries in 1999 and the previous 2 years (678 in 1997 and 951 in 1998) reflects the large numbers of orders during the 1996 to 1998 period. A total of 133 regional jets were delivered during the first 9 months of 1999, a 66.3 percent increase over deliveries during the same 1998 period.

GENERAL AVIATION

By any measure, 1999 was a very good year for general aviation. Unit shipments of general aviation aircraft are well on their way to recording a fifth consecutive year of increase. General aviation manufacturers' shipments increased from 928 aircraft in 1994 to 2,220 aircraft in 1998 (up 139.2 percent) and were up an additional 13.4 percent (1,692 units) during the first 3 quarters of 1999. Of particular importance is the renewed interest in piston powered aircraft. Shipments of piston powered aircraft have more than tripled between 1994 and 1998 (from 499 to 1,534) and were up an additional 10.8 percent (1,164 units) during the first 9 months of 1999.

Shipments of jet aircraft have increased in each of the past 6 years (from 171 in 1992 to 415 in 1998) and are headed toward a seventh consecutive year of increase (352 units, up 26.2 percent) through the first 3 quarters of 1999. The increased sales of jet aircraft reflects, to a large extent, the relative importance of the rapidly growing fractional ownership programs to the industry's current turnaround and its future growth. While shipments of turboprop aircraft

have not fared as well as the other two aircraft categories, shipments totaled 176 (up 8.6 percent) during the first 9 months of 1999.

Billings for general aviation aircraft totaled almost $5.9 billion in 1998, an all-time record high. During the first 9 months of 1999, the industry reported billings of almost $5.5 billion, up 41.0 percent over the same time period in 1998. The large increase in billings relative to shipments reflects increased shipments of the higher unit-priced turbojet aircraft. Export billings and aircraft shipments also increased in 1999, up 73.5 and 12.1 percent, respectively, during the first 3 quarters of the year.

Based on the results of the 1998 General Aviation and Air Taxi Activity Survey, the active general aviation aircraft fleet and hours flown both increased for a fourth consecutive year, up 6.4 and 1.4 percent, respectively. According to the 1998 survey, the active general aviation fleet totaled 204,711 and flew an estimated 28.1 million hours.

General aviation activity counts were up at both FAA and contract towers as well as at en route centers in 1999. Operations at combined FAA and contract towers were up 5.2 percent, with itinerant and local operations up 4.3 and 6.5 percent, respectively. This marks the third consecutive increase in general aviation activity at FAA and contract towered airports and represents a 13.4 percent increase in activity over this 3-year period. Instrument operations at the combined towered airports also increased for a third consecutive year, up 4.9 percent in 1999 and 15.5 percent over the last 3 years.

General aviation activity at FAA en route centers increased for a eighth consecutive year--up 1.9 percent in 1999 and 12.1 percent over the past 3 years. Sustained positive trends in instrument operations and center activity probably reflect continuing growth in business and corporate flying. Additionally, the increase in local operations (generally touch-and-go activity) at FAA and contract towered airports over the past 3 years (up 17.4 percent) shows that the long awaited turnaround in recreational and instructional flying is also well underway.

Following 7 consecutive years of decline, the total number of active pilots increased for a second consecutive year in 1999, totaling 640,113. All four of the major pilot categories showed increases--student, private commercial, and airline transport--in 1999. The number of instrument rated pilots was up nearly 9,000 to 308,951, the second consecutive year of increased numbers.

Of major importance to the general aviation community are the positive statistics regarding student pilots. The number of active student pilots increased for a third consecutive year in 1999 (up 4.4 percent), totaling an estimated 102,000. In addition, preliminary estimates show that the FAA processed a total of 47,091 student pilot certificates (both new and renewals) during the first 8 months of 1999, a 12.6 percent increase over 1998. Preliminary estimates also show that the FAA issued 39,963 original student pilot certificates during the first 8 months of 1999, an increase of 16.9 percent over the same 1998 time period.

Although all of the statistics relating to general aviation activity are encouraging, it is the estimated increase in student pilots, one of the key factors impacting the future of the general aviation industry, that should be good news for the general aviation industry. The industry has, over the past several years, instituted a number of industry-wide programs, including “BE A PILOT,” which are designed to attract new pilots to general aviation. The positive statistics for student pilot certificates processed or issued by the FAA in both 1998 and 1999 shows that these programs are having an impact.

FAA WORKLOAD

At the end of fiscal year 1999, there were a total of 454 towered airports--288 FAA towers and 166 FAA contract towers. This compares to 402 FAA towers and 33 contract towers in 1994, the point at which the FAA began extensive conversions of Level 1 towers. A lawsuit filed against the FAA by the National Air Traffic Controllers Association placed additional conversions under the FAA Contract Program on hold for most of 1998 and 1999.

In 1999, FAA contract towers accounted for 19.2 percent of total combined activity at the 454 towers, up from only 3.0 percent in 1994. As in 1994, the majority of traffic activity at the contract towers is being performed by general aviation, 83.3 percent in 1999 compared to 82.8 percent in 1984.

FAA and Contract Towers

The combined activity counts at FAA and contract towers totaled 68.2 million in 1999, an increase of 4.4 percent over 1998. The increase in the tower counts was, in large part, due to the growth in both general aviation and military activity. General aviation operations were up 5.2 percent while military expanded by 6.1 percent. Commercial operations (the sum of air carrier and commuter/air taxi) totaled 25.2 million, an increase of 3.0 percent. Air carrier operations grew by 2.3 percent while commuter/air taxi operations increased by 4.0 percent. Operations at FAA air traffic control towers totaled 55.1 million in 1999, up 3.9 percent over 1998 activity levels. Operations at contract towers totaled 13.1 million, an increase of 6.6 percent.

Instrument operations at the combined FAA and contract towers totaled 51.8 million in 1999, an increase of 3.7 percent. General aviation activity was up 4.9 percent, while military activity grew by 2.6 percent. Commercial activity expanded by 3.0 percent in 1999. Instrument operations at FAA towered airports (98.6 percent of total combined operations) were also up 3.7 percent in 1999, while instrument operations at contract towers increased 1.7 percent.

FAA En Route Centers

The number of Instrument Flight Rule (IFR) aircraft handled at FAA's en route air traffic control centers totaled 44.7 million in 1999, an increase of 3.4 percent over 1998. The number of commercial and general aviation aircraft handled were up 4.7 and 1.9 percent, respectively. Military activity declined 2.9 percent in 1999.

FAA Flight Service Stations

The number of traditional (non-automated) services provided at FAA Flight Service Stations (FSS) totaled 32.4 million in 1999, a 4.4 percent decline from 1998 levels. All categories of flight services declined in 1999: pilot briefings, down 5.0 percent; aircraft contacted, down 4.3 percent; and flight plans originated, down 3.7 percent.

The number of flight plans originated is generally thought to be an indicator of general aviation activity. The turnaround in the number of flight plans originated in 1997 (up 1.5 percent) did presage the turnaround in general aviation activity at FAA facilities (up 4.3 percent). However, while general aviation activity at FAA facilities continued its turnaround in 1998 and 1999 (up 8.7 percent), the number of flight plans originated failed to follow suit, declining 7.0 percent over the 2-year period.

The Direct User Access Terminal System (DUATS) provides an automated alternative to the FSS for obtaining pilot briefing information

and filing flight plans. The number of weighted DUATS services totaled 13.4 million (up 4.0 percent) in 1999. Combined FSS and DUATS services totaled 45.8 million in 1999, a decline of 2.1 percent from the number of combined transactions recorded in 1998.

FAA AEROSPACE FORECASTS FISCAL YEARS 2000 - 2011

This year's FAA aviation forecast document contains several additions and format changes which were not included in last year's publication. The FAA/Transportation Research Board's (TRB) 11th International Workshop on Future Aviation Activities, held on September 15-17, 1999, recommended that the FAA expand on the air cargo forecasts developed and published in the 1999 forecast document.[1] In response, the FAA has expanded its forecasts of domestic and international air cargo demand (freight/express and mail revenue ton miles) to include a breakout of air cargo demand carried by all-cargo carriers utilizing dedicated cargo aircraft (freighters) as well as cargo demand moved in the belly of passenger aircraft. These forecasts are discussed in Chapter III [2] and are contained in Tables 16-18.

A number of changes have also been made in our handing and reporting of the U.S. commercial air carriers and regional/commuter airline fleets. For the first time, this document contains separate forecasts and tables of passenger and cargo jet aircraft. In addition, the regional/commuter aircraft seat-size categories have been changed to include aircraft with seating capacity greater than 60 seats. This was done to more accurately reflect the changing nature of this fast growing industry. A discussion of the air carrier passenger and cargo fleets can be found in Chapter III, the fleet data in Tables 19 and 20. A discussion of the new regional/ commuter seat-size categories can be found in Chapter IV, the fleet forecast in Table 25.

The format of Chapter III, *Commercial Air Carriers,* has been reformatted to facilitate and enhance the flow and presentation of the information discussed. The new format now includes four distinct sections: (1) a review of 1999 traffic and financial results; (2) domestic passenger assumptions and forecasts; (3) international passenger assumptions and forecasts, and (4) air cargo assumptions and forecasts.

For a second year, the document contains a chapter on commercial space transportation prepared in conjunction with the staff of the FAA's Commercial Space Transportation Office. This chapter is intended to provide an overview of the state of the space transportation and includes forecasts of expected commercial launches over the next several years. The forecasts and discussion can be found in Chapter IX.

The document also contains a special one-time report on "Aviation Scenarios of the Future." This report summarizes the findings from a FAA/industry workshop that assessed the outlook of aviation against four futuristic scenarios—Global Prosperity, Western Hemisphere, Aging America, and Global Climate Change. The report can be found in Appendix A.

ECONOMIC FORECASTS

The economic forecasts used by the FAA to project domestic aviation demand are provided by the Executive Office of the President, Office

[1] The cargo forecasts prepared in 1999, the first since 1983, were in response to recommendations made at the 1997 FAA/TRB Workshop.

[2] The chapters and appendices referenced in the internet version of the Executive Summary can be found in the hardcover edition of FAA Aerospace Forecasts Fiscal Years 2000-2011, March 2000. Copies can be obtained by contacting the FAA's Statistics and Forecast Branch--phone (202) 267-3355 or FAX (202) 267-5370.

of Management and Budget (OMB). In addition to the OMB forecasts, the FAA also uses the U.S. macro economic projections of two commercial forecasting services--DRI/McGraw Hill (DRI) and WEFA, Inc. (WEFA). These alternative forecasts provide the FAA with a range of economic forecasts with which to gauge the risk associated with variations from the OMB projections. The FAA uses the world and individual country economic projections provided by WEFA to forecast the demand for international aviation services.

Readers of this document should be aware that effective October 28, 1999, the Bureau of Economic Analysis, U.S. Department of Commerce, changed the reference year for calculating price indexes and chained dollar estimates of GDP from 1992 to 1996. In addition, a number of definitional and classification improvements have been made which results in an upward revision to the historical growth rate of real GDP—from 2.8 percent on average since 1984 to 3.2 percent. The changes also result in an upward revision in the historical growth rate of world GDP—approximately 0.1 percent annually. A more detailed discussion of these changes is presented in Chapter II.

In any given year there are likely to be variations around the long-term trend. None of the current economic models used by the FAA are sufficiently precise to predict interim business cycles. In addition, unanticipated developments, such as the recent Southeast Asia financial crisis or the 1998 Northwest Airlines' strike cannot be predicted.

In addition to the economic forecasts prepared by OMB and the economic forecasting services, the FAA incorporates many of the relevant assumptions developed at the FAA/TRB 11th Annual International Workshop. Although the FAA makes use of the recommendations and assumptions developed by all nine industry panels, it relies heavily on the assumptions and forecasts prepared by the three industry panels on general aviation--Light General Aviation, Business Aviation, and Vertical Flight--in preparing its general aviation and helicopter forecasts.

The projected growth of aviation demand discussed in this and subsequent chapters is consistent with the national short- and long-term economic growth forecasts discussed in greater detail in Chapter II. Table I-1 summarizes the key U.S. and world economic assumptions used in developing the domestic and international aviation demand forecasts. Annual historical data and economic forecasts are presented in tabular form in Tables 1 through 5.

United States Economy

While there is agreement among most economic forecasters as to the general direction of the U.S. economy--sustained growth--there are differences among the economic projections supplied by OMB, DRI, and WEFA as to the expected growth in individual years of the forecast period. The two forecasting services bracket OMB's projected growth in 2000, with expected U.S. economic growth ranging from 3.4 to 3.8 percent. However, OMB is generally more pessimistic than either forecasting service over the remainder of the forecast period. While both OMB and the two forecasting services expect the U.S. economy to slow during the 2001 to 2004 period, the OMB slowdown is more pronounced than that of either WEFA or DRI.

The OMB economic forecasts anticipate moderate growth throughout the forecast period. In the short-term, U.S. real GDP is projected to increase by 3.5 percent in 2000, slowing to average growth of 2.6 percent over the next 4 years. GDP is forecast to increase at an average annual growth rate of 2.8 percent over the entire 12-year forecast period. The consumer price index is projected to remain in the moderate range throughout the 12-year forecast period,

increasing at an average annual rate of 2.6 percent.

The oil and gas deflator is expected to increase by 23.8 percent in 2000, then decline by 15.7 percent in 2001. The relatively large increase in fuel prices in 2000 reflects two factors: the increased worldwide demand for oil resulting from the recovery of Southeast Asia economies; and the ability of OPEC members to maintain production quotas. Fuel prices are forecast to increase at an average annual growth rate of 2.1 percent over the entire 12-year forecast period, the result being a 0.5 percent annual decline in real fuel prices. An increase in real fuel prices occurs only in the year 2000. Real fuel prices decline throughout the remaining 11 years of the forecast period.

No major disruptions in the price or availability of oil have been assumed during the 12 year forecast period.

World Economy

Worldwide economic growth is expected to exceed that of the United States by approximately 0.5 percent annually over the 12-year forecast period, increasing at an average annual rate of 3.3 percent. Economic growth is forecast to be greatest in Latin America and the Far East/ Pacific, expanding at annual rates of 4.4 and 4.3 percent, respectively. These high rates of growth assume that the two regions will experience slower growth in 2000 as their respective economies continue to recover from the impacts of Southeast Asian and Brazilian financial crises, then resume strong growth over the remainder of the forecast period. Economic growth in Europe/Africa/Middle East countries and Canada is expected to average 2.8 and 2.5 percent, respectively, over the forecast period.

AVIATION TRAFFIC AND ACTIVITY FORECASTS

The large commercial air carrier traffic and activity forecasts are summarized in Table I-2. A detailed discussion of the forecasts and underlying assumptions can be found in Chapter III. Year-to-year historical data and forecasts can be found in Tables 6 through 22.

The regional/commuter and general aviation forecasts are summarized in Table I-3. Detailed discussions of the forecasts and underlying assumptions for the regionals/commuters and general aviation can be found in Chapter's IV and V, respectively. Year-to-year historical data and forecasts can be found in Tables 23 through 25 for regionals/commuters and Tables 26 through 30 for general aviation.

Commercial Aviation

Domestic Air Carrier Passenger Traffic

Domestic air carrier RPMs and passenger enplanements are forecast to increase at annual rates of 4.1 and 3.6 percent, respectively, over the 12-year forecast period. The forecast assumes that domestic RPMs and enplanements will grow by 4.0 and 3.2 percent, respectively, in 2000, then slow during the 2001 to 2003 period in response to a slowing of U.S. economic activity. During this 3-year period, RPMs and enplanements are expected to average only 3.5 and 2.9 percent growth, respectively. However, a quickening in U.S. economic activity beginning in 2004, results in relatively strong demand throughout the remainder of the forecast period. Domestic RPMs and enplanements increase at average annual rates of 4.4 and 3.9 percent, respectively, over the last 8 years of the forecast period.

Declining real yields also impact domestic traffic demand in the short-term. Real yields are expected to decline by 3.2 percent annually during the 2000 to 2003 time period. This relatively large decline in real yields over the early years of the forecast is based on the assumption that air carriers will hold the line on fare increases to counteract the slowing of demand that results from the slowing of the U.S. economy. Thereafter, real yields are expected to decline by an average of 0.3 percent annually over the remainder of the forecast period. Real yields decline by an average of 1.3 percent annually over the entire 12-year forecast period.

The decline in real yields reflects the expected continuation of strong competitive forces (both domestically and internationally) throughout the forecast period. Competition in domestic markets will come from second-tier carriers such as Delta Express, United Express, and MetroJet (USAirways); established low-fare carriers such as Southwest; as well as from new low-fare start-ups such as JetBlue Airways. Internationally, increased competition will come from expanded open skies agreements and new and existing global alliances.

Air carrier aircraft operations are forecast to increase at an annual rate of 2.8 percent during the 12-year forecast period. The slower growth in activity at FAA air traffic facilities relative to expected traffic increases (3.6 percent growth in domestic enplanements) reflects the efficiencies which result from the assumed increases in both domestic average aircraft size (up 0.6 seats annually) and the passenger trip length (up 4.2 miles annually). However, no gains are expected to be achieved from increased domestic passenger load factors. The current forecast assumes that load factors will reach 70.0 percent in 2006 (up from 69.8 percent in 1999) and remain at this level through 2011.

International Air Carrier Passenger Traffic

Forecasts of total passenger traffic (U.S. and foreign flag carriers) are provided between the United States and three world travel areas--Atlantic, Latin America (including Mexico and the Caribbean), and the Pacific/Far East--as well as for U.S./Canadian transborder traffic. These forecasts are based on historical passenger statistics obtained from the United States Immigration and Naturalization Services and Transport Canada and on regional world historical data and economic projections obtained from WEFA.

Total passenger traffic between the United States and the rest of the world is expected to grow from 132.0 million in 1999 to 239.4 million in 2011, an average annual growth rate of 5.1 percent. Passenger traffic is expected to be strongest in Latin American and Pacific markets, growing at annual rates of 6.1 and 6.0 percent, respectively, over the forecast period. Passenger traffic is projected to grow 4.3 percent annually in Atlantic markets and 3.6 percent a year in Canadian markets.

U.S. air carrier international RPMs and passenger enplanements are forecast to increase at average annual rates of 5.8 and 5.5 percent respectively, over the 12-year forecast period. The stronger growth in international travel relative to domestic markets is being driven by the strong passenger demand projected in the Latin America and Pacific/Far East markets—both up 6.1 percent. Passenger enplanements in the Pacific/Far East markets are forecast to increase by only 3.6 and 4.7 percent during the first two years of the forecast as the region continues to recover from its current financial crisis. However, passenger demand in the Pacific/Far East is expected to increase at an average annual rate of 6.5 percent over the remaining 10 years of the forecast period. Passenger enplanements in the Atlantic

markets are projected to grow by 4.4 percent annually over the 12-year forecast period.

The air carrier forecasts assume that commercial air carriers will continue to benefit from the moderate to strong economic growth expected to take place both within the United States and worldwide. It is also assumed that electronic technology improvements, along with a continuation of cost containment efforts, will benefit the overall financial performance of both U.S. and foreign flag carriers. In addition, the operation of a fleet consisting entirely of more fuel-efficient stage-3 aircraft (or retrofitted/ reengined aircraft) should result in further cost savings and increased industry productivity. These productivity improvements should strengthen the industry's overall financial performance.

Regionals/Commuters Passenger Traffic

The regional/commuter industry consists of carriers that report on DOT Form 298-C (85 carriers in 1999) and DOT Form-41 (8 carriers in 1999). For reporting purposes, the designation is based on aircraft size--carriers operating aircraft with more than 60 seats report all traffic, whether transported on larger or smaller aircraft, on DOT Form 41. All other carriers report on DOT Form 298-C.

In 1999, the regional/commuter airlines enplaned 72.4 million passengers, 11.8 percent of all passenger traffic in scheduled domestic air service. By the year 2011, these carriers are expected to carry 137.5 million passengers (5.5 percent annual growth) and to account for 14.6 percent of all domestic passenger enplanements.

Regional/commuter airlines RPMs are expected to increase by 7.4 percent annually over the forecast period, growing from 18.8 billion in 1999 to 44.6 billion in 2011. Most of the growth in regional/commuter traffic is expected to occur among the Form 41 carriers (RPMs and enplanements up 7.9 and 5.7 percent, respectively) or the larger Form 298-C carriers who operate the new regional jets.

The significantly higher growth in RPMs relative to enplanements is the result of expected large increases in the average passenger trip length for regional/commuter carriers, increasing from 260.2 miles in 1999 to 324.1 miles in 2011. This increase in trip length is due to the continued integration of large numbers of regional jets (1,203 over the 12-year forecast period) and high-speed turboprops into the regional/commuter fleets. These aircraft, with ranges of up to 1,000 miles, are expected to open up new opportunities for growth in nontraditional regional/commuter markets. The increased use of regional jets is also expected to lead to further route rationalization by the larger commercial air carriers, including markets in the 400 to 500 mile range and beyond. This phenomenon is expected to be one of the drivers of growth for the regional/commuter carriers during the first half of the forecast period.

The move to greater use of regional jets and larger propeller-driven aircraft results in the average seating capacity of the regional fleet increasing from 36.0 seats in 1999 to 44.3 seats in 2011. Most of the growth in aircraft seat size occurs among the larger Form 41 carriers whose average aircraft seat size increases to 50.5 seats in 2011, up from 42.8 seats in 1999. Form 298-C carriers' average aircraft seat size increases from 31.3 seats in 1999 to 39.2 seats in 2011. The number of regional jets in U.S. regional/ commuter service is projected to grow from 343 in 1999 to 1,546 in 2011.

Air Cargo

Air cargo demand by U.S. commercial air carriers is expected to grow at annual rates that are about

1.0 percent higher than those forecast for passenger demand. System RTMs are forecast to grow at an annual rate of 5.9 percent (compared to 4.6 percent for system RPMs) over the 12-year forecast period, with domestic and international RTMs increasing 5.2 and 6.6 percent, respectively.

Cargo freight/express RTMs are forecast to more than double over the forecast period as a strong global economy stimulates the demand for the rapid movement of goods and products by air, both domestically and internationally. Domestic freight/express RTMs are forecast to increase from 11.5 billion tons in 1999 to 21.6 billion tons in 2011, an increase of 5.4 percent annually. International freight/express RTMs, owing to stronger worldwide economic growth, are projected to increase at an average annual rate of 6.7 percent over the forecast period, from 13.6 to 29.5 billion.

Most of the growth in freight/express RTMs is expected to come from the all-cargo carriers operating dedicated cargo aircraft. All-cargo domestic and international freight/express RTMs increase at annual rates of 6.4 and 8.3 percent, respectively, over the 12-year forecast period. The percent of domestic freight moved by all-cargo carriers increases from 78.2 percent in 1999 to 87.7 percent in 2011, international freight/express from 53.6 to 64.4 percent.

Significantly slower growth is forecast for mail RTMs as electronic alternatives (fax, email, direct bill payment, etc.) cut into the volume of mail moved by air. Domestic and international mail RTMs are projected to increase at annual rates of 3.8 and 3.1 percent over the forecast period, with domestic mail increasing from 2.4 to 3.8 billion RTMs and international mail from 509 to 736 million RTMs in 2011.

All-cargo carriers account for 29.7 percent of mail RTMs in 2011, up from 25.0 percent in 1999. The disparity in all-cargo carrier's share of mail RTMs relative to its share of freight/express traffic (74.2 percent in 2011) reflects the fact that passenger carriers operate flights throughout the day while the majority of all-cargo carrier operations occur at night. Despite this scheduling disadvantage, all-cargo carrier mail RTMs increase by 5.2 percent annually over the forecast period compared to annual growth of only 3.1 percent for the passenger carriers.

GENERAL AVIATION

The general aviation active fleet is projected to total 230,995 in 2011, an increase of just over 24,000 aircraft or 0.9 percent annual growth over the 12-year forecast period. In 2011, piston powered fixed-wing aircraft are expected to account for the majority of the fleet, 76.7 percent compared to 79.4 percent in 1999. However, the turbine powered fixed wing fleet is expected to make the biggest inroads in the general aviation active fleet, increasing its share from 6.1 percent in 1999 to 8.0 percent in 2011. In 2011, experimental aircraft account for 8.6 percent (up from 8.1 percent in 1999) of the fleet while rotorcraft comprise 3.9 percent of the fleet (up from 3.7 percent in 1999).

The current forecast assumes that the business use of general aviation aircraft will expand at a more rapid pace than personal use. This is due, in large part, to the continued rapid growth in fractional ownership and is reflected in the changing composition of the general aviation fleet mix. The more expensive and sophisticated turbine-powered fleet (including rotorcraft) is projected to grow at four-times the rate forecast for the piston aircraft categories—2.8 compared to 0.7 percent. Turbine-powered fixed wing aircraft are projected to increase at an average annual rate of 3.2 percent, totaling 18,535 in 2011—7,240 turboprops and 11,295 turbojets. The turbine rotorcraft fleet is expected to increase at an annual rate of 1.6 percent over the forecast period, totaling 6,010 in 2011.

The general aviation piston fleet is projected to increase by just under 14,000 aircraft over the

forecast period, totaling 180,180 aircraft in 2011. The single engine fixed wing piston aircraft category increases at an average annual rate of 0.7 percent--from 145,250 aircraft in 1999 to 158,400 in 2011. The number of piston powered rotorcraft increase by just over 400 aircraft, totaling 3,030 in 2011. Multi-engine fixed wing piston aircraft are expected to remain constant at 18,750 aircraft throughout the forecast period.

Experimental aircraft are projected to increase by 1.5 percent annually, reaching 19,910 aircraft in 2011. Aircraft in the "other" category (gliders, lighter-than-air, etc) are expected to total 6,360 in 2011, up from 5,640 in 1999.

General aviation hours flown is projected to increase at an average annual rate of 2.2 percent over the 12-year forecast period, to 38.8 million hours in 2011. The larger increase in hours relative to aircraft reflects expected increases in the utilization of the general aviation fleet. In 2011, piston powered aircraft are projected to fly 26.6 million hours (up 1.5 percent annually) while turbine-powered aircraft fly 10.5 million hours (up 4.5 percent annually). Most of the increase in utilization occurs in turbojet aircraft, the fastest growing category of general aviation aircraft—active fleet and hours up 4.8 and 7.3 percent annually, respectively. These large increases are due to the expected increases in both the fractional ownership fleet and its activity levels. Utilization of fractional ownership aircraft average approximately 900 hours annually compared to only 325 hours for all business jets.

The number of active pilots are forecast to total 824,490 in 2011, an increase of over 184,000 (2.1 percent annually) over the 12-year forecast period. Most of the expected growth is projected to occur in the student and airline transport categories. The number of student pilots are projected to increase by over 50,000 (3.4 percent annually), totaling 152,500 in 2010. Airline transport pilots are forecast to increase from 137,642 in 1999 to 198,100 in 2011, an average annual increase of 3.1 percent. Projected growth among other types of pilot certifications include: private pilot certificates, 1.4 percent annually to 306,600; commercial pilot certificates, 1.4 percent annually to 147,300; and helicopter only pilots, 2.0 percent annually to 9,745.

FAA WORKLOAD FORECASTS

There were a total of 454 towered airports at the end of September, 288 FAA towers and 166 contract towers. The number of FAA contract towered airports is expected to increase by a total of 22 during 2000. This includes the conversion of 22 FAA towered airports, the addition of one new contract tower, and the closing of one contract tower. Most of the conversions are scheduled to take place during the first quarter of the year.

Since 1993, a total of 114 FAA towers have assumed contract tower status. To overcome any reporting inconsistencies caused by the tower conversion program, the FAA has, since 1996, developed separate activity forecasts for both FAA and contract towered airports. Activity at FAA Air Route Traffic Control Centers and Flight Service Stations are not affected by the contract tower conversions.

Summary forecasts of aircraft activity at combined FAA and contract tower facilities can be found in Table I-4. Summary forecasts of activity at FAA facilities only, including FAA towers, en route centers, and flight service stations, can be found in Table I-5. More detailed forecasts and discussion of aircraft activity at FAA and contract facilities can be found in Chapter VII and in Tables 31 through 48.

FAA and Contract Towers

Activity at the combined FAA and contract towers is projected to grow from 68.2 million in

1999 to 86.9 million in 2011, an annual increase of just over 2.0 percent. The majority of this growth is expected to result from increased commercial aircraft activity. Between 1999 and 2011, air carrier activity is forecast to increase 2.8 percent annually, while commuter/air taxi activity is projected to increase 2.6 percent a year.

General aviation activity is projected to increase from 40.0 million operations in 1999 to 49.2 million operations in 2011, an annual increase of 1.7 percent. The FAA does not forecast military activity, and so it is held constant at its 1999 activity level (3.0 million) throughout the 12-year forecast period.

The projected large increase in the numbers of regional jets and general aviation turbine aircraft is expected to result in instrument operations increasing at faster rates than total tower operations. Combined instrument operations counts at FAA and contract towered airports increase from 51.8 million in 1999 to 67.6 million in 2011, an annual increase of 2.2 percent.

Commercial aircraft instrument operations are forecast to increase at a significantly faster rate than are general aviation instrument operations, up 2.7 and 1.9 percent, respectively. Military activity is expected to remain at 3.5 million operations through 2011.

En Route Centers

The workload at FAA en route traffic control centers is forecast to increase at an average annual rate of 2.4 percent during the 12-year forecast period. In 2011, FAA en route centers are expected to handle 59.4 million IFR aircraft, up from the 44.7 million in 1999

The number of commercial aircraft handled is projected to increase at an annual rate of 2.7 percent while the number of general aviation aircraft handled increases at an average annual rate of 2.0 percent. Military activity at en route centers is held constant at its 1999 activity level of 4.1 million.

The higher growth rate at FAA en route centers, relative to activity at combined towered airports, reflects the fact that commercial activity accounts for a significantly larger percentage of center activity—71.2 versus 37.0 percent at towered airports in 1999. Therefore, the projected larger increases in commercial aircraft activity have a much greater impact on total center traffic during the forecast period.

Flight Service Stations

Total flight services originating at FAA flight service stations are forecast to decline from 32.4 million in 1999 to 31.4 million in 2011, an average annual rate of decline of 0.3 percent. Of the services provided by the FAA, only flight plans originated is projected to increase over the forecast period, growing from 6.3 million in 1999 to 6.8 million in 2011. Both pilot briefings and the number of aircraft contacted are forecast to decline over the next 12 years, down 0.7 and 1.7 percent annually.

The number of DUATS services are projected to grow at an average annual rate of 2.8 percent over the forecast period, from 13.4 million in 1999 to 18.6 million in 2011. Combined FSS and DUATS services are expected to total 50.0 million in 2011, an annual increase of 0.7 percent.

FORECAST RISKS

There are a number of positive signs that point toward a continuation of moderate to strong growth in both the commercial and general

aviation industries, not the least of which is the projected strong growth in both the U.S. and worldwide economies. However, there are also a number of uncertainties that could cause the growth of the U.S. and world economies to be less than that projected. Slower economic growth would, ultimately, slow the demand for aviation services.

Much has been said about the strong economic recovery now taking place in Southeast Asia—the scene of the devastating financial crisis in 1997 and 1998. The latest WEFA forecast (November 1999) for the region includes real GDP growth of 3.2 percent in 1999 and 3.4 percent in 2000. This strong recovery is predicated on the up-graded outlook for the economies of South Korea, Singapore, Thailand, Malaysia, and Japan. However, on December 6, the Japanese government reported that third quarter GPD declined by one percent, after posting positive gains during the two previous quarters. This raises uncertainty as to whether Japan has finally shaken off its 8-year economic malaise. WEFA projected that Japan's GDP will increase by 1.3 percent in 1999 and 1.4 percent in 2000. Failure of the Japanese economy to respond to government stimulus could slow the expected recovery in air travel on routes to Japan and the Far East.

WEFA also projects that Latin American real GDP will increase by 3.4 percent in 2000 and 4.1 percent in 2001. However, the region experienced a 0.4 percent decline in economic activity in 1999 and only two major countries—Peru and Mexico--experienced growth over the past year. The outlook for Latin America continues to depend on political actions rather than economic fundamentals. The greatest risk to the expected recovery comes from a failure of the Brazilian government to implement necessary financial reforms. Additionally, the 2000 presidential elections in Mexico could create uncertainty for investors, resulting in a flight of investment capital and the collapse of the peso. If either Brazil or Mexico fails to grow as predicted, growth of traffic on Latin America routes could slow.

Although there appears to be unanimity among the economic forecasting services and OMB regarding continued strong growth in U.S economic activity, there are a number of factors that could slow or reverse this optimistic outlook.

Over the past several years, the U.S. economy has benefited considerably from the "wealth effect" created by the large increase in market equity values. This has resulted in unprecedented increases in both consumer spending and consumer sentiment--the Conference Board's index of consumer confidence for December was at its highest level in more than 3 decades. Any large sustained correction in the stock market equity values, considered inevitable by many economists, could be followed by a sharp decline in consumer spending for goods and services, including air travel.

Additionally, the rising cost of fuel could present a major risk for all segments of the economy, in particular aviation. The current OMB forecast assumes a 23.8 percent increase in fuel prices in 2000, followed by a 15.7 percent reduction in 2001. Sharply higher fuel prices appear to be inevitable in the near-term and these higher costs will almost certainly have an impact on the consumer's discretionary income and spending patterns. If the projected scale back in fuel prices in 2001 doesn't materialize, the potential impact on U.S. and world economic growth and air travel could be considerable.

Any slowing of U.S. economic growth will impact the earnings of corporations and ultimately, travel budgets. In addition, much of corporate America continues to be at odds with the U.S. commercial airline industry over what it perceives as unreasonable and rapidly increasing fares for business travelers. Business could implement a number of measures to contain rising travel costs, including a cutback in commercial air travel and/or a shift to travel by corporate jets or fractional ownership companies.

The general aviation industry is also vulnerable to an economic slowdown or recession, although not to the same extent it would have been several years ago. The turnaround in the demand for general aviation products and services since the passage of the General Aviation Revitalization Act in 1994 has occurred during a period of unprecedented economic growth. No one actually knows how the industry or its customers would react to a protracted slowing of demand or an economic recession.

Increased flight delays are becoming a growing problem to the airlines, the traveling public, and the FAA. Delays are not a recent phenomena, but a fact of life for air transportation, be they weather, schedule, or air traffic control related. However, delays are closely linked to demand and increased delays are a potential risk to achieving the aviation demand forecasts presented in this document.

Given the strong growth in aviation demand during the 1990s, the real question is why delays did not become an issue until just recently. Prior to 1997, a number of unrelated factors combined to constrain the growth of activity at FAA air traffic facilities. As such, activity at combined FAA/contract towers actually declined by 0.3 percent annually during the 1990-96 time period. En route center activity increased at an annual rate of 1.4 percent during the same 7-year period, the higher growth due to its larger percentage of commercial activity as compared to tower activity—71.2 versus 36.9 percent.

Air carrier passenger traffic grew by 4.1 percent annually during the 1990-96 time period. However, much of the growth was absorbed through increased load factors (up 5.8 percentage points). During this same period, regional/ commuter traffic increased at annual rate of 12.8 percent. Again, a large part of this growth was absorbed through increased load factors (up 4.3 percentage points) and increased aircraft size (up 5.3 seats). Additionally, both general aviation and military activity at FAA facilities remained below pre-1990 levels, the latter the result of declining military budgets.

However, it is the growth over the last 3 years that has given rise to increased delays. During this period, activity at combined FAA and contract towers and en route centers grew at average annual rates of 3.3 percent. The reasons behind these relatively large increases are as follows:

- Large air carrier load factors appear to be approaching their maximum levels. Also, based on known future aircraft orders and options, there will be little or no efficiency gains to be achieved through increased aircraft size. The industry has essentially decided to compete on schedule frequency. As such, future activity growth will closely mirror the rate of increase in traffic.

- A total of 243 new regional jet aircraft were delivered to U.S. regional/commuter air carriers over the past 2 years. Despite continued increases in load factors and aircraft seat size, regional/commuter ASMs grew by 23.3 percent during these 2 years while commuter/air taxi activity at FAA/contract towers increased 5.4 percent. Regional/commuter activity at en route centers was up 13.2 percent during the same 2-year period. A total of almost 700 regional jets are scheduled to be delivered to the regional/commuter fleets over the next 5 years and more than 1,200 will be delivered over the entire forecast period.

- General aviation appears to be growing as demonstrated by the increased activity at FAA air traffic facilities over the past 3 years. General aviation activity at FAA/contract towers was up 13.5 percent, a large part of it business and corporate activity at the 29 large hub airports (up 8.5 percent). Activity at en route centers was up 12.1 percent. The large numbers of jet aircraft on order by fractional ownership companies point toward a continuation of strong business/corporate

travel while the success of the industry's "learn to fly" programs assure continued growth in both instructional and personal flying.

- Military budgets appear to be on the increase and this has resulted in an increase in military flying. As such, military activity at FAA/contract towers was up 17.2 percent over the past 2 years; center traffic increased 4.4 percent. If future military budgets continue to increase or remain stable, we can expect military flying to continue to increase in future years.

A projected high level of growth among all four-user groups is a phenomenon that has not been witnessed by the FAA since the late 1970s. What these increased activity levels presage in terms of future air traffic delays or constraints on future demand is something that should be of concern to the FAA, aviation officials, and the flying public.

If the economic scenarios presented in this document--sustained moderate growth for both the U.S. and world economies--are achieved, there is every reason to believe that the demand for commercial and general aviation products and services will continue to expand throughout the forecast period. The real question is whether there will be enough capacity (airside and landside) to accommodate the projected growth.

FORECAST SUMMARY

Highlights of the current FAA aviation forecasts for the 2000 to 2011 time period include:

- The U.S. economy is expected to grow at a rate about one-half percent less than that of worldwide economic activity (2.8 versus 3.3 percent annually), with most of world economic growth taking place in the Latin American (4.4 percent annually) and the Pacific/Far East (4.3 percent annually).

- International passenger traffic is forecast to grow significantly faster than U.S. domestic traffic (5.5 versus 3.6 percent annually), with most of the international growth occurring in Latin American and Pacific/Far East markets, both up 6.1 percent annually.

- Regional/commuter passenger traffic will continue to grow at a faster rate than their larger domestic counterparts (5.5 versus 3.6 percent annually). Growth in the industry is derived from the establishment of new markets utilizing the new regional jets and from further route rationalization by the larger commercial carriers.

- Air cargo traffic is expected to grow at rates about one and a half percent higher than those predicted for passenger traffic, with domestic and international RTMs increasing at annual rates of 5.2 and 6.6 percent, respectively.

- The growth being exhibited throughout the general aviation community, combined with industry-wide promotional programs, is expected to result in moderate sustained increases in the active fleet (0.9 percent annually), hours flown (2.2 percent annually), and student pilots (3.4 percent annually).

- Total aviation activity at FAA and contract facilities is expected to grow at annual rates of 2.0 to 2.4 percent annually, with commercial activity (up 2.7 percent annually) increasing at significant higher rates than those predicted for general aviation (1.7 to 2.0 percent annually).

Uncertainties which have the potential to limit the growth in the demand for U.S. and international aviation services include:

- The economic problems in Japan and Brazil pose significant risks to the economies of other countries in Asia and South America. If

current internal economic problems are not resolved, there is potential for significant economic slowdowns or recessions in Asia and South America.

- The large fare increases experienced by business travelers could result in reduced future business travel and corporate travel budgets, and/or speed the introduction and/or acceptance of alternatives to air travel, i.e., teleconferencing.

Nevertheless, air transportation is expected to continue to dominate all other transportation modes in both long distance domestic inter-city travel and in international passenger markets throughout the foreseeable future.